

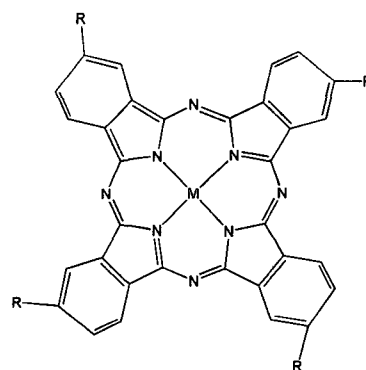
SYNTHESIS OF A SERIES OF PHTHALOCYANINE AND THEIR INTERACTION WITH COLLOIDAL TiO₂

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The potential use of phthalocyanine as the sensitizing dye in the dye-sensitized solar cell was investigated by several authors.^[1] Its strong absorption in the visible region of spectrum and good stability make it a good choice for this application. However, in order to select the phthalocyanine more reasonably, some guidelines of their photostability are needed.

Six phthalocyanine with different central elements and different ring substituent groups, MgPc, MgPc(NO₂)₄, MgPc(NH₂)₄, ZnPc, ZnPcTS, ZnPc(iso-PrO)₄, were synthesized according to the traditional method.^[2] The colloidal TiO₂ were prepared using the hydrolysis method.^[3]

The following graph illustrated the changes during the adding of the colloidal TiO₂ to the solution of MgPc and ZnPcTS. With the isobestic points between 500 nm and 700 nm, we can conclude that association between phthalocyanine and colloidal exists. Its apparent association constant can be calculated assuming that the absorbance of composite in the Q-band is negligible, which is 2156 M⁻¹ for MgPc and 1800M⁻¹ for ZnPcTS.



M: 2H, Mg, Zn

R: -H, -NO₂, -iso-Pro

-NH₂, -SO₃H

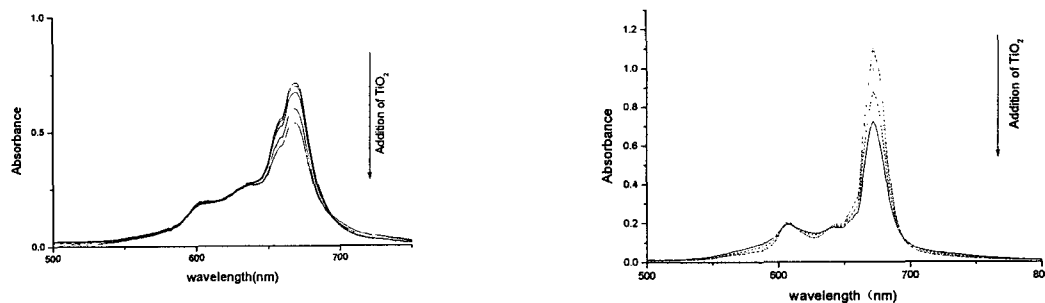


Figure 1 UV-vis spectrum when adding colloidal TiO₂